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Integral equation tools for 2D scattering of RF waves by blobs. LISE-MARIE IMBERT-GERARD, Courant Institute - NYU — We will present a numerical method for 2D scattering by blobs. The method is based on potential theory, and provides an integral formulation of the continuous problem. The formulation depends on the plasma density on the one hand, and on the incident wave on the other hand. The main challenge is then to discretize the volume integral term of the equation. A high order discretization scheme will be introduced. It relies on the identification of a near-field regime, close to the singluarity of the kernel, and a far-field regime. The precomputation phase is crucial to both the accuracy and the speed of the scheme. The resulting linear system is dense. It is solved thanks to a pre-existing fast direct solver, called HODLR, providing a compressed approximation of the inverse matrix. The method has been developped for the O mode equation, and numerical examples will be presented. The development of a similar method for the full cold plasma model is under investigation. The principal difficulty relies on deriving a well-posed integral formulation with a structure adapted to our discretization tools. Preliminary results in this direction will be discussed.

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